

WHAT IS CLAIMED IS:

1     1.     An inductor device, comprising:  
2             a first coil conductor located over a substrate and having a first conductivity and a  
3     first pattern; and  
4             a second coil conductor located on a substantial portion of said first coil  
5     conductor, having a second conductivity substantially greater than said first conductivity,  
6     and having a second pattern substantially conforming to said first pattern.

1     2.     The inductor device as recited in Claim 1 wherein said first coil conductor  
2     comprises one selected from the group consisting of:  
3             a non-magnetic metal;  
4             a non-magnetic metal alloy;  
5             a magnetic metal;  
6             a magnetic metal alloy;  
7             doped polysilicon; and  
8             a polycide conductor material.

1     3.     The inductor device as recited in Claim 1 wherein said second coil conductor  
2     comprises aluminum.

1     4.     The inductor device as recited in Claim 1 wherein said second coil conductor  
2     comprises an aluminum alloy.

1     5.     The inductor device as recited in Claim 1 further comprising a patterned  
2     passivation layer located over said first coil conductor and having at least one opening  
3     exposing at least a portion of said first coil conductor, wherein said second coil conductor  
4     contacts said first coil conductor in said at least one opening.

1     6.     The inductor device as recited in Claim 1 further comprising:  
2             a parallel coil separated from said first coil conductor by an insulator layer and  
3     having a third pattern substantially conforming to said first pattern; and  
4             a via extending through said insulator layer and connecting said first coil  
5     conductor and said parallel coil.

1     7.     The inductor device as recited in Claim 1 wherein said first pattern is a spiral  
2     pattern having a shape selected from the group consisting of:  
3             a square;  
4             a rectangle; and  
5             an octagon.

1     8.     The inductor device as recited in Claim 1 wherein said second coil conductor has  
2     a thickness of about 12,000 angstroms.

1     9.     The inductor device as recited in Claim 1 wherein said inductor device has a  
2     series resistance that is less than about 0.3  $\Omega$ .

1     10.    The inductor device as recited in Claim 1 wherein said inductor device has a  
2     quality factor of at least about 20.

1 11. A method of manufacturing an inductor device, comprising:  
2 forming a first coil conductor over a substrate, said first coil conductor having a  
3 first conductivity and a first pattern; and  
4 forming a second coil conductor on a substantial portion of said first coil  
5 conductor, said second coil conductor having a second conductivity substantially greater  
6 than said first conductivity and having a second pattern substantially conforming to said  
7 first pattern.

1 12. The method as recited in Claim 11 wherein said first coil conductor comprises  
2 one selected from the group consisting of:  
3 a non-magnetic metal;  
4 a non-magnetic metal alloy;  
5 a magnetic metal;  
6 a magnetic metal alloy;  
7 doped polysilicon; and  
8 a polycide conductor material.

1 13. The method as recited in Claim 11 wherein said second coil conductor comprises  
2 aluminum.

1 14. The method as recited in Claim 11 wherein said second coil conductor comprises  
2 an aluminum alloy.

1 15. The method as recited in Claim 11 further comprising forming a patterned  
2 passivation layer over said first coil conductor, said patterned passivation layer having at

3 least one opening exposing at least a portion of said first coil conductor, wherein said  
4 second coil conductor contacts said first coil conductor in said at least one opening.

1 16. The method as recited in Claim 11 further comprising:  
2 forming a parallel coil having a third pattern substantially conforming to said first  
3 pattern;  
4 forming an insulator layer over said parallel coil, wherein said insulator layer  
5 interposes said first coil conductor and said parallel coil; and  
6 forming a via extending through said insulator layer and connecting said first coil  
7 conductor and said parallel coil.

1 17. The method as recited in Claim 11 wherein said first pattern is a spiral pattern  
2 having a shape selected from the group consisting of:  
3 a square;  
4 a rectangle; and  
5 an octagon.

1 18. The method as recited in Claim 11 wherein said second coil conductor has a  
2 thickness of about 12,000 angstroms.

1 19. The method as recited in Claim 11 wherein said second coil conductor has a  
2 thickness selected to provide a resistance equivalent to about 8,400 angstroms thick  
3 copper.

- 1 20. The method as recited in Claim 11 wherein said forming said second coil
- 2 conductor includes depositing and etching a metal layer.

1     21.     An integrated circuit device, comprising:  
2             a substrate;  
3             an inductor device, including  
4                 a first coil conductor located over said substrate and having a first  
5 conductivity and a first pattern, and  
6                 a second coil conductor located on a substantial portion of said first coil  
7 conductor, having a second conductivity substantially greater than said first conductivity,  
8 and having a second pattern substantially conforming to said first pattern;  
9             an active device located in said substrate; and  
10            interconnects coupling said active device and said inductor device.

1     22.     The integrated circuit device as recited in Claim 21 wherein said first coil  
2 conductor comprises one selected from the group consisting of:  
3             a non-magnetic metal;  
4             a non-magnetic metal alloy;  
5             a magnetic metal;  
6             a magnetic metal alloy;  
7             doped polysilicon; and  
8             a polycide conductor material.

1     23.     The integrated circuit device as recited in Claim 21 wherein said second coil  
2 conductor comprises aluminum.

1     24.     The integrated circuit device as recited in Claim 21 wherein said second coil  
2 conductor comprises an aluminum alloy.

1 25. The integrated circuit device as recited in Claim 21 wherein said inductor device  
2 further includes a patterned passivation layer located over said first coil conductor and  
3 having at least one opening exposing at least a portion of said first coil conductor,  
4 wherein said second coil conductor contacts said first coil conductor in said at least one  
5 opening.

1 26. The integrated circuit device as recited in Claim 21 wherein said inductor device  
2 further includes:  
3 a parallel coil separated from said first coil conductor by an insulator layer and  
4 having a third pattern substantially conforming to said first pattern; and  
5 a via extending through said insulator layer and connecting said first coil  
6 conductor and said parallel coil.

1 27. The integrated circuit device as recited in Claim 21 wherein said first pattern is a  
2 spiral pattern having a shape selected from the group consisting of:  
3 a square;  
4 a rectangle; and  
5 an octagon.

1 28. The integrated circuit device as recited in Claim 21 wherein said second coil  
2 conductor has a thickness of about 12,000 angstroms.

1 29. The integrated circuit device as recited in Claim 21 wherein said inductor device  
2 has a series resistance that is less than about 0.3  $\Omega$ .

- 1 30. The integrated circuit device as recited in Claim 21 wherein said inductor device
- 2 has a quality factor of at least about 20.



1    31.    An inductor device comprising:  
2            a substrate;  
3            a first metal layer comprising  
4                    a first conductor formed in a closed pattern on said substrate, and  
5                    a first metal interconnect feature on said substrate;  
6            a first dielectric formed atop said first conductor;  
7            a first coil conductor formed on said first dielectric layer in a closed pattern  
8 substantially overlying said first conductor and being in electrical contact with said first  
9 conductor;  
10           a passivation layer formed atop said first coil conductor; and  
11           a second coil conductor formed on said passivation layer in a closed pattern  
12 substantially overlying said first coil conductor and being in electrical contact with said  
13 first coil conductor.